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ZOOLOGY.

Abnormal Repetition of Parts.—Bateson has figured[1] some interesting cases of monstrosities of this sort. In *Cancer pagurus* he finds an external maxilliped which has been converted into a pincer like that of the large claw. In other specimens of the same species he finds three specimens in which the pincer has a tendency to duplicate itself, as is well known to those who have studied these malformations. Another instance is a specimen of *Chrysomela banksii*, with three tarse on the right posterior leg. In a specimen of *Antedon rosacea* a pair of the arms show a branching into four at some distance from the body. The last case is a pilchard with an abnormal number of scales, No discussion is given of these instances, but Mr. Bateson has in progress an essay on the variation of multiple parts.

The Embryology of Spiders.—K. Kishinouye has been studying the development of some Japanese spiders. His descriptions of the early stages[2] are to be regarded as confirmative rather than making an important advance. At one stage he finds the yolk free from nuclei, the germ-layers arising later from the primitive cumulus and the posterior cloud of Claparède. He differs, however, in some points from Claparède and others in the interpretations of the early surface views. Among the interesting points brought out are the following: The first abdominal segment has no appendage at any stage. The lung books are developed in the base of the appendages of the second abdominal segment, in exactly the way necessary to support the view of their homology with the gill books of Limulus. An abortive trachea develops in the same way from next appendage. The coxal glands are shown to consist of a cœlomic pouch and an ectodermal duct,—a fact which goes far to support their homology with nephridia, and to lessen the weight of Eisig's argument. The author is convinced that the malpighian tubes are not ectodermal; he thinks them mesodermal, but apparently is not familiar with the results of those authors who assign them to the entodermal structures. Some facts additional to those of Locy are given regarding the development of the eyes. The stecoral pocket is regarded as developing from an unpaired posterior cœlomic pouch.

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[1] Proc. Zool. Socy. London, 1890, p. 579.

[2] Journal of the College of Science, Imperial University, Japan, Vol. IV., 1890.

Insects of Central Africa.—H. Grose Smith catalogues[3] 111 species of Lepidoptera; W. L. Distant, 48 Rhynchota; and H. W. Bates, 73 Coleoptera, collected by William Bonney in the Great Forest of Central Africa while on the Emin Pasha relief expedition. The number of novelties is comparatively small, and the insect fauna shows very marked resemblances to that of the western coast of Africa.

Studies on Amphioxus.—F. E. Weiss has had the opportunity to study at Naples some points in the anatomy and physiology of Amphioxus which needed elucidation. The basis of his work was the paper by Professor Lankester,[4] in which many unsolved questions were pointed out. Weiss now settles[5] some of these. Feeding with carmine seems to show that there is not that intimate connection of cœlom with the vascular system that had been supposed. Many ot the connections and relations of the circulatory tubes have been made out, while the most interesting discovery is that of excretory tubules, paired and branchiomeric, occurring at the upper part of the branchial apparatus, in connection with the secondary or tongue-bars. Each of these tubules is supplied with a comparatively large blood-vessel. It is bent in the shape of the letter S, and empties into the atrial cavity. Weiss was not certain whether it communicates with the cœlom or not, his sections failing to settle this point. These tubules are regarded as nephridial, but the author does not regard them as homologous with the pair of tubes described by Lankester. Another point of interest is that many points on the surface have also excretory functions.

The Amphibian Blastopore.—R. V. Erlanger has attacked this oft-studied problem, and concludes[6] that the anus is formed from the ventral, and the neurenteric canal and neuropore from the dorsal, margin of the blastopore. In the Anura the blastopore closes, and the anus later breaks through within its limits, while in the Urodeles there is no closing.

The Position of the Sun Grebes.—The systematic position of the Heliornithidæ has been very uncertain. Recently F. E. Beddard has had an opportunity of studying the anatomy of *Podica senegalensis*, and concludes[7] that if the muscles alone were concerned the sun grebes would be placed with the Pygopodes, but that osteology alone would refer them to the vicinity of the rails, though it differs from the latter in the sternum. The characters peculiar to the Heliornithidæ are the absence of an aftershaft, the form of the sternum, the shape and relations of the interclavicular, in the fusion of the pubes with the ischia, and the absence of post-acetabular ridges, in the arrangement of the intestinal coil, and in the form of the biceps crusis. On the whole, Beddard thinks it a distinct family, which has traversed for a certain distance the branch leading from the rails to the Colymbidæ, and has then diverged rather widely in a direction of its own.

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[3] Proc. Zool. Soc. London, 1890.

[4] *Vide* AMERICAN NATURALIST, XXIII., p. 639, 1889.

[5] *Quart. Jour. Mic. Sci.*, XXXI., p. 489, 1890.

[6] *Zool. Jarbuch*, Abth. Anat. und Ontogenie, IV., p. 239, 1890.

[7] Proc. Zool. Socy. London, 1890.

Zoological Notes.—Cœlenterata.—The habits of the sea pens (Vergularia, etc.) have not been certainly known. Edgar Thurston says that near Madras *V. juncea* sticks straight up in the sand, and that as soon as touched they go down deeper and deeper, so that frequently a spade is necessary to secure them.

G. C. Bonme[8] gives a catalogue of 55 Hydroids growing at Plymouth, England. The only novelty is *Haloikema* (n.g.) *lankesterii*, a Halecium-like form with non-retractile polyps.

Molluscs.—The Opisthobranch molluscs of Plymouth, England, are catalogued[9] by Walter Garstang. Fifty-two species are enumerated, while very full notes are given of many species. The student of Nudibranchs on the New England coast cannot neglect this paper.

Vertebrates.—Some five years ago the discovery in Mauritius of a cave containing the body of the dodo was announced. It appears that this was probably a mistake, two recent letters[10] showing that the person making the announcement had been imposed upon. The caves of Mauritius are not such as to contain such remains, swept as they are by frequent floods.

Boulenger gives[11] a synopsis of the genus Arges, describing six species, two of which are new. They come from the Andes of Equador and Peru.

Howes believes that the proatlas is a normal feature in Hatteria, and regards it as a vestigial vertebra. He has found several specimens of this form with the vomerine teeth, discovered by Baur, and refers to their relationship to similar teeth in Paleohatteria.

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[8] Jour. Marine Biol. Ass. United Kingdom, No. 4, p. 391, 1890.

[9] Jour. Marine Biol. Ass. United Kingdom, No. 4, p. 399, 1890.

[10] Proc. Zool. Socy. London, 1890, p. 402.

[11] Proc. Zool. Socy., 1890, p. 450.

Dr. Emil Schoebel contributes[12] an account of the post-embryonic development of the eye of the Amphibia. The eye has almost all of its essential features at the beginning of larval life, and, contrary to the title of the paper, the author describes the features before as well as after hatching.

EMBRYOLOGY.[1]

A New Text-Book on the Embryology of Invertebrates.—Dr. E. Korshelt and Dr. K. Heider have recently published the first volume of a "Lehrbuch der Vergleichenden Entwicklungsgeschichte der Wirbellosen-Thiere" (Jena, 1890, Gustav Fishcher). Since the publication of Balfour's "Treatise on Comparative Embryology," written more than ten years ago, there have been published an immense number of papers dealing with the embryology of animals; and the authors believe there is a pressing need of bringing these together, and making a new inventory of the accumulated material. The present book is confined to the results on invertebrates, inasmuch as the papers on vertebrate embryology have been brought together, within the last few years, in well-known treatises on the subject. The first volume treats of the Sponges, Cnidaria, Ctenophora, Platyhelminthes, Nemertines, Nemathelminthes, Annelids, Echinoderms, and a few smaller groups. In the second volume the authors promise to treat of the Arthropods, Molluscs, Molluscoids, Tunicates, and Amphioxus; and the book will close with a general part.

The substance of the first volume is largely made up of reviews of the most important papers published since Balfour's time, and, so far as we can judge, these are admirably presented, and are noticeable for clearness as well as conciseness of statement. The authors believe fully in the evidence of embryology to solve most of the problems of phylogeny. They hold fast to the gastrula ancestry of the Metazoa, and each larval form is marshaled up to tell its tale of how the groups arose. This diagrammatic conception certainly admits of clearness of treatment; but whether it represents the high-water mark of morphological speculation may be open to doubt.

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[12] *Zool. Jahrbuch*, Abth. Anat. Ont., IV., p. 297, 1890.

[1] Edited by Dr. T. H. Morgan, Johns Hopkins University, Baltimore, Md., to whom books and pamphlets for review should be sent.